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*** U R G E N T ***

PLEASE FORWARD TO

MANO PADMANABHAN

To: Mano Padmanabhan   Fax No. 703-746-7004

                                                 Phone No.: 703-306-2903

From: Roz Donaldson

             Eric A. Stephenson, Reg. No. 38,321

	Date Sent:	September 10, 2004
Application No.: 10/614,306		
Attorney Docket No.: VRT0059US	Fax Operator:	Roz Donaldson

This transmittal consists of 18 page(s), including this cover sheet.

Applicant(s):   Oleg Kiselev
Assignee: VERITAS Software Corporation
Title: Application-Assisted Recovery From Data Corruption
                   in Parity RAID Storage Using Successive Re-reads
Application No.:   10/614,306
Filing Date: July 3, 2003
Attorney Docket: VRT0059US

~~~ Dear Mano ~~~

Pursuant to our phone conversation earlier this week, enclosed please find the first page of the Japanese references previously cited in the Petition to Make Special filed on 5-14-04. The Petition was previously faxed to you on Sept. 2 and Sept. 9, but you mentioned that you would have to download the JP references.

We truly appreciate your taking the time to search for this Petition! Let me know if you need anything further. Thank you and have a nice day!

If you do not receive all pages, please call Roz (512) 439-5082

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(19) **JAPANESE PATENT OFFICE**

PATENT ABSTRACTS OF JAPAN

(11) Publication number: 03259320 A

(43) Date of publication of application: 19.11.91

(51) Int. Cl
G06F 3/06
G06F 3/08
G06F 12/00

(21) Application number: 02058626

(22) Date of filing: 08.03.90

(71) Applicant: NEC CORP TOHOKU NIPPON DENKI SOFTWARE KK
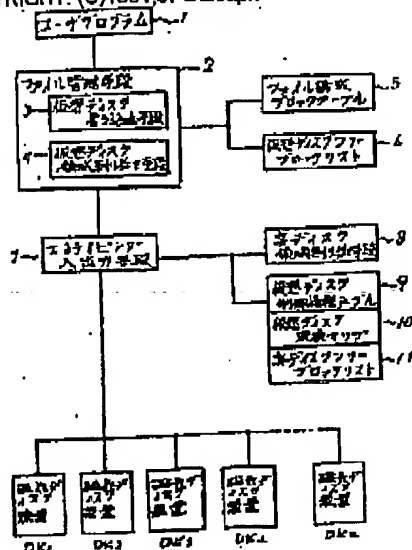
(72) Inventor: NAKA SEIICHIRO
MUKAIDA HIDETOSHI

(54) STRIPING AREA ALLOCATING SYSTEM

COPYRIGHT: (C)1991 JPO&Japio

(57) Abstract:

PURPOSE: To effectively use space by converting the request of input/output on a virtual disk to an input/output request on a real magnetic disk by a file managing means including a virtual disk area allocating means, and performing the input/output by a striping system.

CONSTITUTION: A file area allocation request with requested size from a user program 1 is written on a file constitutional block table 5 via the virtual disk allocating means 3 of the file managing means 2. At this time, a free block number to be allocated is stored in a virtual disk free block 6. When the input/ output request is issued from the user program 1 to the area of the virtual disk, the file managing means 2 designates a block number by referring to the file constitutional block table, and perform the input/output of the write of a file on the real disk device by the striping system. In such a way, it is possible to effectively use the space on the magnetic disk device.

-1-

(19) **JAPANESE PATENT OFFICE**

PATENT ABSTRACTS OF JAPAN

(11) Publication number: **04038532 A**

(43) Date of publication of application: 07.02.92

(51) Int. Cl
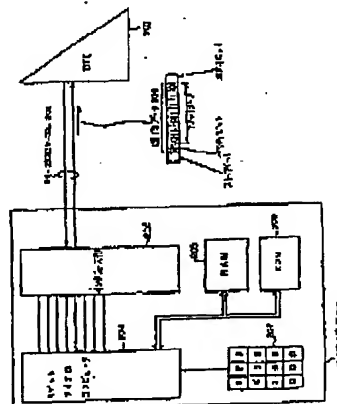**G06F 11/10**
H03M 13/00

(21) Application number: 02144424

(22) Date of filing: 04.06.90

(71) Applicant: **FUJITSU LTD FUJITSU COMMUN SYST LTD HASEGAWA ELECTRIC CO LTD**

(72) Inventor: **ONO HIROSHI**
TODO MASAHIRO
SATO YUKIE
SANO ATSUYOSHI
MURAI ATSUYA

(54) **DATA CHECKING SYSTEM FOR PARITY GENERATION USING TABLE**

COPYRIGHT: (C)1992,JPO&Japio

(57) Abstract:

PURPOSE: To decrease a program capacity as a whole in a parity generation processing by discriminating it by AND arithmetic between a table data and a transmitted data whether each bit of the transmitted data is '1' or not.

CONSTITUTION: The data checking table of a ROM 20B stores the table data for which only a first bit, only a second bit, only a third bit and only a fourth bit are '1' respectively. A parity bit P in the transmitting data is fixed to '0', and a counter indicating the address of the data checking table and a counter indicating the number of '1' in the transmitting data are cleared to 0. Afterwards, the AND arithmetic is successively executed between the transmitting data and each table data of the data checking table and when the arithmetic result is not 0, the counters are incremented. By executing this processing concerning all the table data, it is discriminated whether the bit number of 1 in the transmitted data is odd or even, and the parity bit is prepared.

-1-

(19) **JAPANESE PATENT OFFICE**

PATENT ABSTRACTS OF JAPAN

(11) Publication number: **05053927 A**

(43) Date of publication of application: 05.03.93

(51) Int. Cl
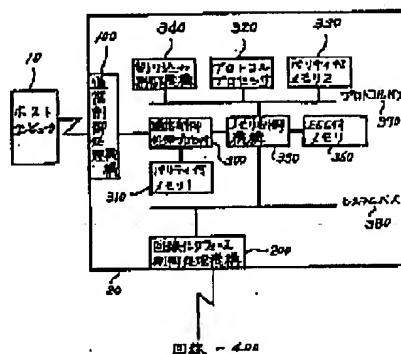
G06F 12/16
G06F 11/10

(21) Application number: 03211885

(22) Date of filing: 23.08.91

(71) Applicant: HITACHI LTD HITACHI JOHO -NETWORK:KK

(72) Inventor: TANAKA KENICHI
UGAJIN ATSUSHI

(54) MEMORY PARITY FAULT RECOVERING SYSTEM   COPYRIGHT: (C)1993,JPO&Japio

(57) Abstract

PURPOSE: To recover a fault at a software by correcting a fault generating bit by exclusively ORing the calculated value of exclusive OR for the unit of a logical memory containing a fault generating address and the value of an error correction table.

CONSTITUTION: A leading address to search the memory parity fault generating address is extracted from the parity fault correction table and set to a protocol processor 320. Data showing the bus width length of the address are read out of a memory 330 or 310 with parity. It is checked by scanning the inside register of a memory control mechanism 350 whether the parity fault occurs or not. The fault generating address is saved in a fault generating address save area. The address to be next read is calculated, the exclusive OR of the read data and the value of the exclusive OR up to the moment is defined as data for memory parity fault recovery and by exclusively ORing the data and an expected value, the fault generating bit is corrected. Afterwards the data are written in the saved address.

-1-

(19)   JAPANESE PATENT OFFICE

PATENT ABSTRACTS OF JAPAN

(11) Publication number: **05100953 A**

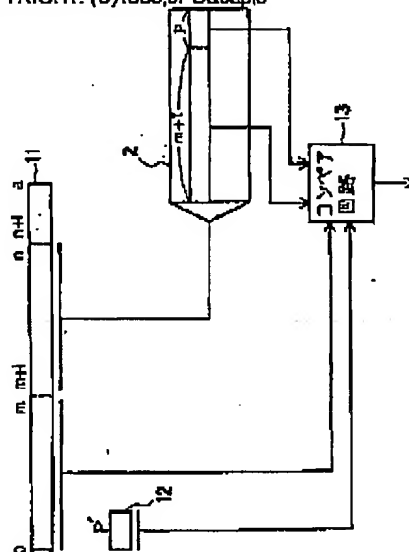(43) Date of publication of application: **23.04.93**

(51) Int. Cl   **G06F 12/08**
                      G06F 11/10
                      G06F 12/08

(21) Application number: 03260921

(22) Date of filing: 09.10.91

(71) Applicant: **PFU LTD**

(72) Inventor: · **SUGINO KAZUHITO**

(54) **CACHE MEMORY CONTROL SYSTEM**

COPYRIGHT: (C)1993,JPO&Japio

(57) Abstract:

PURPOSE: To prevent system-down caused by a parity error by comparing an output of a cache management table, and a part of an address signal from a processor and its parity code, and executing a cache hit/cache mishit processing.

CONSTITUTION: A cache management table 2 inputs a second part (m+1 to n bit part) used for accessing it, and outputs information (m+1 bit length) corresponding thereto and a parity code (p) thereby. A comparing circuit 13 compares a prescribed output of a processor and an output of the cache management table 2. That is, a first signal consisting of a first part (0 to m bit part) and a parity code p' outputted from the processor, and a second signal consisting of the information (m+1 bit length) of the output of the cache management table 2 and the parity code (p) are compared, and in the case a second signal is a signal for generating a parity error, a fact that a first signal and a second signal do not coincide with each other is outputted.

-1-

(19) JAPANESE PATENT OFFICE

PATENT ABSTRACTS OF JAPAN

(11) Publication number: **05233282 A**

(43) Date of publication of application: 10.09.93

(51) Int. Cl
G06F 9/38
G06F 11/00
G06F 11/14

(21) Application number: 04024950

(22) Date of filing: 12.02.92

(71) Applicant: **NEC CORP KOUFU NIPPON DENKI KK**

(72) Inventor: **MORISADA TAKESHI KIMURA MASAYUKI**

(54) FAULT PROCESSING SYSTEM FOR BRANCH HISTORY TABLE

(57) Abstract:

PURPOSE: To improve the probability (of instruction restart after the processing of a fault generated in data read out from a branch history table.

CONSTITUTION: This branch history table fault processing system is characteristically provided with branch instruction address buffer 3 constituting a branch history table, the 1st and 2nd parity check circuits 6,7 for detecting whether an error is included in data read out from a branched address buffer 4 or not, an AND circuit 9 for suppressing the propagation of error data from the branch history table at the time of detecting an error by the circuits 6, 7, and a parity check flag 11 for suppressing the supply of an instruction after detecting the error data by the circuits 6, 7. Since fault processing is started at the division of instructions, instruction processing can be restarted after ending the fault processing.

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(19) **JAPANESE PATENT OFFICE**

PATENT ABSTRACTS OF JAPAN

(11) Publication number: **05233469 A**

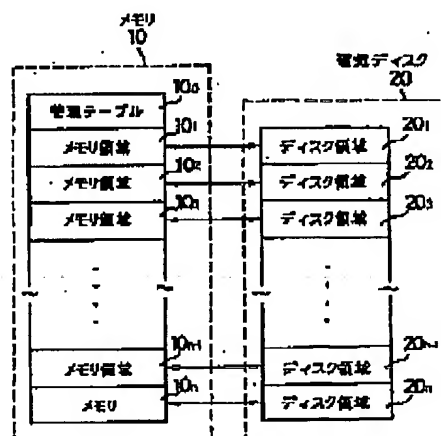(43) Date of publication of application: **10.09.93**

(51) Int. Cl **G06F 12/16**

(21) Application number: **04035124**

(22) Date of filing: **21.02.92**

(71) Applicant: **NEC ENG LTD**

(72) Inventor: **MATSUKI TAKAYUKI**

(54) DATA MANAGEMENT SYSTEM

COPYRIGHT: (C)1993,JPO&Japio

(57) Abstract

PURPOSE: To eliminate the need to copy the contents of a memory to a magnetic disk before the power source of a device is turned OFF and to easily make a recovery from a parity error even if the parity error occurs when data are read out of the memory.

CONSTITUTION: Flags in a management table 10_0 are searched for to easily judge whether or not data in storage areas 10_1, 10_2-10_n of the memory match data in paired storage area 20_1, 20_2-20_n on the magnetic disk; when they match each other, the data are read out of the memory as they are, but when not, the data are copied from the storage areas on the magnetic disk to the memory temporarily and read out. When the data are copied, the flags are so set as to indicate the copying and then the data can continuously be read out of the memory unless there is new variation. The data are copied similarly even in the case of parity error occurrence during a read out of the memory, and a recovery from the parity error can be made.

(19) JAPANESE PATENT OFFICE

PATENT ABSTRACTS OF JAPAN

(11) Publication number: 06266508 A

(43) Date of publication of application: 22.09.94

(51) Int. Cl **G06F 3/06**

G06F 3/06

(21) Application number: 05050398

(22) Date of filing: 11.03.93

(71) Applicant: HITACHI LTD

(72) Inventor: FUJII TETSUHIKO.
YAMAMOTO AKIRA
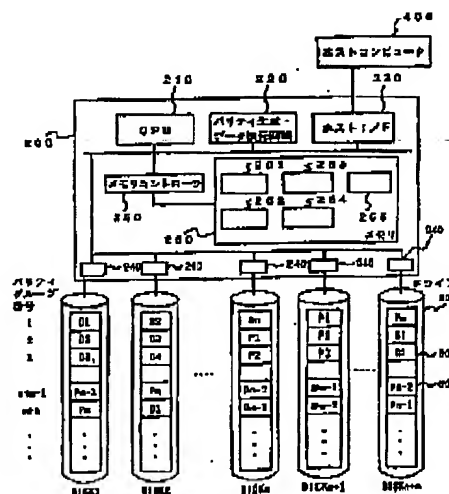SATO TAKAO
YOSHIDA MINORU

(54) DISK ARRAY CONTROL METHOD

(57) Abstract:

PURPOSE: To prevent the increase of the frequency in access by using data and redundant data, which are stored in disk devices other than a disk device where a fault is detected, to restore data of this disk device and recording this data in the disk.

CONSTITUTION: If a parity group of a processing object is not restored yet, a classification (c) of data/redundant data stored in a faulty disk is obtained in this parity group. When the classification (c) indicates data, numbers of disks where data and redundant data belonging to the same parity group are stored are obtained from a parity constitution management table 264 for the purpose of restoring data, and they are read out from pertinent disks to restore data in the faulty disk. Restored data or generated redundant data is written over redundant data selected for overwrite, and restoration state management information corresponding to the entry in the parity group of the processing object in a restoration state management table 263 is changed from the unrestored state to the already restored state to terminate the processing.

(19) JAPANESE PATENT OFFICE

PATENT ABSTRACTS OF JAPAN

(11) Publication number: **06266510 A**

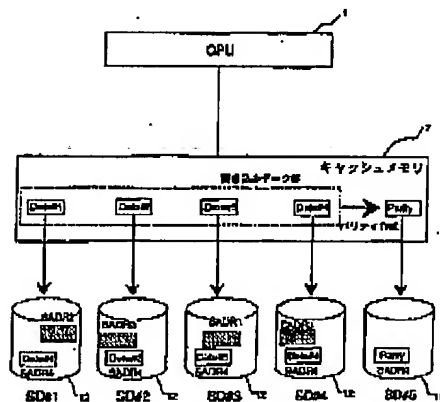(43) Date of publication of application: 22.09.94

(51) Int. Cl
G06F 3/06
G06F 3/06
G06F 3/06

(21) Application number: 05051663

(22) Date of filing: 12.03.93

(71) Applicant: HITACHI LTD

(72) Inventor: TSUNODA HITOSHI
TAKAMOTO YOSHIFUMI
KAMO YOSHIHISA

(54) DISK ARRAY SYSTEM AND DATA WRITE METHOD AND FAULT RECOVERY METHOD FOR THIS SYSTEM

(57) Abstract:

PURPOSE: To reduce the overhead for write with respect to a disk array of RAID (level 5) where data is distributed to improve the processing performance.

CONSTITUTION: Even if data #1 to #4 already written in addresses SADR1 to SADR3 in a drive as data belonging to groups different from one another will be rewritten with write data, these write data are regarded as new write data and are written in the idle area of an address SADR4 in the drive in parallel. Updated old data is not read out. A nullity flag is registered in an address conversion table with respect to updated old data, and data is read from the newly written area. When all of data in original parity groups are made ineffective, areas holding these groups are used as idle areas. Effective data in parity groups which are made partially ineffective are justified at a proper timing.

(19) **JAPANESE PATENT OFFICE**
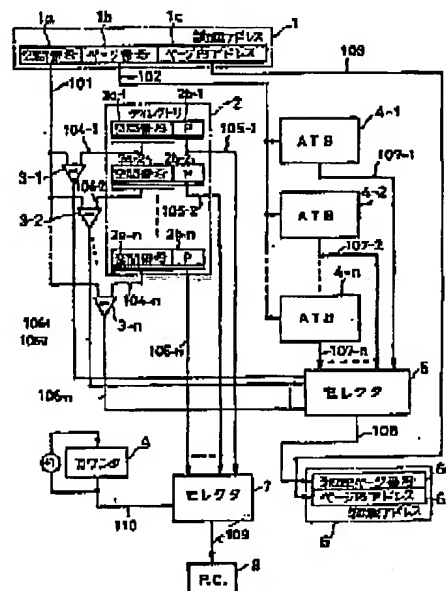
PATENT ABSTRACTS OF JAPAN

(11) Publication number: **06259331 A**

(43) Date of publication of application: **16.09.94**

(51) Int. Cl
G06F 12/10
G06F 11/10

(21) Application number: 05069399

(22) Date of filing: 03.03.93

(71) Applicant: **NEC CORP KOFU NIPPON DENKI KK**

(72) Inventor: **NISHIGAKI YASUHIRO**
TODA HIDEMASA

(54) **STORAGE ACCESS PROCESSOR**

(57) Abstract

PURPOSE: To decrease the hardware quantity by selecting address space information and parity information corresponding to plural address conversion tables in order and inspecting normalcy.

CONSTITUTION: When a physical address is generated with a page number in a physical page number holding part 6a and an in-page address in an in page address holding part 6b, a selector 7 selects the space number and parity data 105-1 to 105-n of a directory 2 in order on the basis of the counted value 110 generated by a counter 9 in order. A parity check circuit 8 makes a parity check on the basis of the space number and parity 109 selected by the selector 7 in order. Further, a counter 9 increases the counted value 110, one by one, and resets its contents when the counted value 110 reaches the number (n) of the address conversion tables 4-1 to 4-n.

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(19) JAPANESE PATENT OFFICE

PATENT ABSTRACTS OF JAPAN

(11) Publication number: 07230361 A

(43) Date of publication of application: 29.08.95

(51) Int. Cl
G06F 3/06
G06F 3/06
G06F 12/00
G06F 12/16

(21) Application number: 06232775

(22) Date of filing: 28.09.94

(30) Priority: 24.12.93 JP 05326823

(71) Applicant: HITACHI LTD HITACHI COMPUT ENG CORP LTD

(72) Inventor: YAMASHITA YOJI
TAKAHASHI HIDEO
HATAKEYAMA ATSUSHI
KATO KANJI
TAKEMURA HIROSHI
URATANI IKUO
KITO AKIRA
MAKI TOSHIYUKI
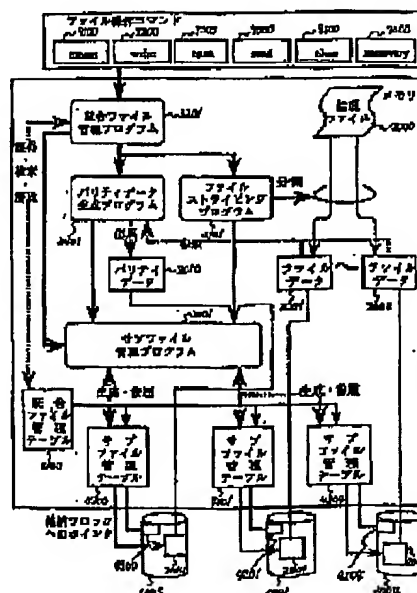YAMADA HIDENORI
SHIROTA KOJI
TAKARA AKIKO

(54) METHOD AND DEVICE FOR FILE MANAGEMENT

(57) Abstract

PURPOSE: To provide the method and the device for file management of high performance and high reliability.

CONSTITUTION: The file management device is provided with a file striping means 3101, which divides data of a file into plural data, and a subfile management means 3301 which uses sub-file management tables 4201 to 4204 and 4300 to manage divided data of the file with respect to each disk device. The device consists of a parity data generating means 3401, which operates exclusive OR of data at intervals of the same byte displacement from the head position of each subfile to generate parity data, and an integrated file management means 3201 which uses an integrated file management table 4100 to manage the file.

(19) **JAPANESE PATENT OFFICE**

PATENT ABSTRACTS OF JAPAN

(11) Publication number: **08272546 A**

(43) Date of publication of application: 18.10.96

(51) Int. Cl	G06F 3/06
	G06F 3/06

(21) Application number: 07071286

(22) Date of filing: 29.03.95

(71) Applicant: **SHIKOKU NIPPON DENKI SOFTWARE KK**

(72) Inventor: **WAKESAKA HIROSHI**

(54) DISK ARRAY DEVICE

(57) Abstract:

PURPOSE: To avoid the degradation of performance at the time of data update processing in the disk array device of RAID.

CONSTITUTION: This device is provided with a data comparison circuit 3 to compare old data with updated data, a parity update table 4 to store the contents of parity data on the basis of information by the data comparison circuit 3, and a parity correction circuit 5 to correct the parity data by the information by the parity update table 4 and the parity update table 4. Thus, other processing can be executed to an HDD (magnetic disk device) without accessing the HDD in which the old parity data is stored, and the performance can be improved.

(19) JAPANESE PATENT OFFICE

PATENT ABSTRACTS OF JAPAN

(11) Publication number: **10049313 A**

(43) Date of publication of application: 20.02.98

(51) Int. Cl

G06F 3/06

G06F 3/06

(71) Applicant: NIPPON TELEGR & TELEPH CORP <NTT> N T T INTELLIGENT TECHNOL KK

(72) Inventor: MIZUKAMI MAKOTO
ISOMURA YOSHINORI
IZAWA NOBUYOSHI
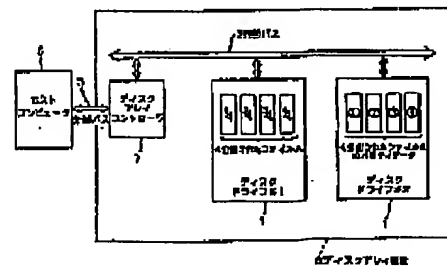SAKURAI KOSUKE
MATSUMOTO TAKASHI
SHIROMIZU HIROAKI
KONO TAKASHI

(54) EXTENDED DISK ARRAY DEVICE

(57) Abstract:

PROBLEM TO BE SOLVED: To provide the extended disk array device which may be low in initial investment and can optionally be increased in storage capacity as a system is extended.

SOLUTION: A data file is divided by a predetermined number irrelevantly to the number of the disk drives included in the device and parity data corresponding to the divided files are generated; and the divided files and parity data are decentralized to and recorded on disk drivers 1. The arrangement relation between the divided files and parity data, and the respective disk drives is recorded in a divided data arrangement management table in a disk array controller 7; when a disk drive is added, the divided files are grouped corresponding to the total number of the drives and dispersedly recorded on the respective disk drives and new parity data are generated and recorded to update the divided data arrangement management table.

(19) **JAPANESE PATENT OFFICE**

PATENT ABSTRACTS OF JAPAN

(11) Publication number: **11203056 A**
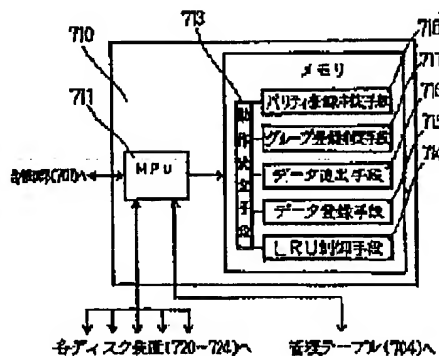
(43) Date of publication of application: 30.07.99

(51) Int. Cl
G06F 3/06
G06F 3/06

(21) Application number: 10007321

(22) Date of filing: 19.01.98

(71) Applicant: **FUJITSU LTD**

(72) Inventor: **TAKEDA SUIJIN**

(54) INPUT/OUTPUT CONTROLLER AND ARRAY DISK DEVICE

COPYRIGHT: (C)1999,JPO

(57) Abstract:

PROBLEM TO BE SOLVED: To eliminate deceleration of access speed and to enable high-speed access by providing a cache managing part with a group register means for discriminating whether the other data consisting of a parity group, to which the data of access object belong, are registered on a cache memory or not.

SOLUTION: A group registration discriminating means 717 of a cache managing part 710 judges whether the other data consisting of the parity group, to which the object data belong, are already registered in the cache memory or not. The group registration discriminating means 717 refers to an entry table in a managing table. The group registration discriminating means 717 retrieves the logical block number of data as the access object out of 'object blocks' in the entry table. When the object logical block is detected, the parity data of the parity group, to which the object data belong, are already registered in the cache memory but when such a block is not detected, these data are not registered.

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(19) **JAPANESE PATENT OFFICE**

PATENT ABSTRACTS OF JAPAN

(11) Publication number: **11224166 A**

(43) Date of publication of application: **17.08.99**

(51) Int. Cl	G06F 3/06
	G06F 3/06
	G06F 12/16
	G06F 12/16

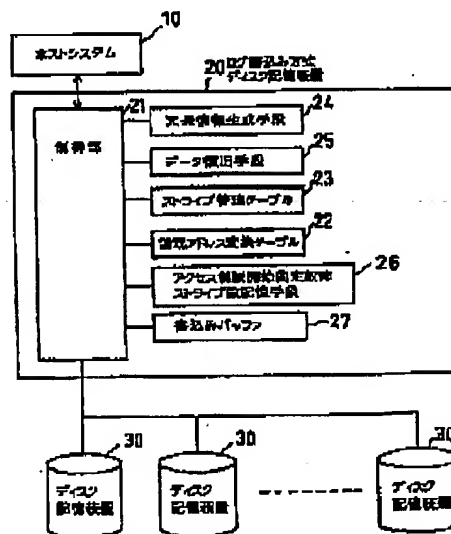|	
(21) Application number: 10024592	(71) Applicant: **TOSHIBA CORP**
(22) Date of filing: 05.02.98	(72) Inventor: **MOTOSAWA KUNIAKI**

(54) **FAULT AVOIDING METHOD FOR STORAGE AREA IN LOG IN TYPE DISK STORAGE DEVICE, DISK STORAGE DEVICE, AND COMPUTER-READABLE STORAGE MEDIUM USED IN THE SAME DEVICE**

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(57) Abstract:

PROBLEM TO BE SOLVED: To provide a highly reliable, high speed log in type disk storage device by improving avoiding of a fault due to a fixed failure in a part of storage area, a fault avoiding method in the storage area in the log in type disk storage device, and a computer-readable storage medium where program information of the same method is stored.

SOLUTION: A log in type disk storage 20 which connects a host system 10 and a disk storage 30 is provided internally with a control part 21 and a logical address conversion table 22, a stripe management table 23, a redundant information generating means 24, a data recovering means 25, an access limitation start fixed fault stripe number storage means 26, and a write buffer 27. Consequently, the avoiding of a fault due to a fixed failure in a part of storage area can be improved and highly reliable, high speed performance can be realized.

(19) JAPANESE PATENT OFFICE
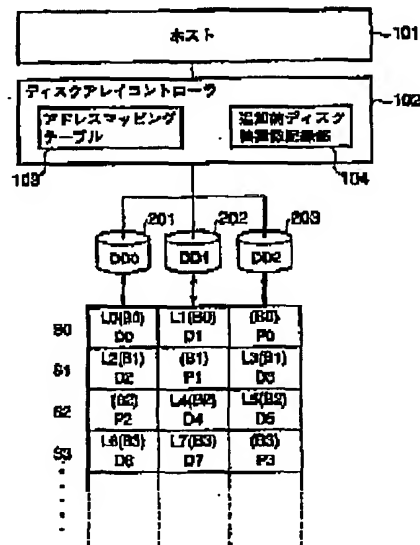
PATENT ABSTRACTS OF JAPAN

(11) Publication number: **2000010738 A**

(43) Date of publication of application: 14.01.00

(51) Int. Cl   **G06F 3/06**

G06F 12/16

(21) Application number: 10170322

(22) Date of filing: 17.06.98

(71) Applicant: **TOSHIBA CORP**

(72) Inventor: **MOTOSAWA KUNIAKI**
SEKIDO KAZUNORI

(54) DISK ARRAY SYSTEM, STORAGE CAPACITY EXTENSION METHOD APPLIED IN THE SYSTEM, AND RECORD MEDIUM

(57) Abstract:

PROBLEM TO BE SOLVED: To efficiently perform the storage capacity extension processing by addition of a disk device in a disk array system of RAID(redundant array of inexpensive disk) constitution.

SOLUTION: N+1 where N is the number of disk devices constituting the disk array before addition of a disk device is recorded in a pre-addition disk device number recording part 104 in a disk array controller 102. An address mapping table 103 where mapping information of logical addresses as the disk array after addition and physical addresses of individual disk devices are to be stored is generated, and mapping of logical addresses and physical addresses used before addition of the disk device is stored in the address mapping table 103. '0' is written in all areas of the disk device to be added. By '0' write, areas of the disk device to be added can be added to each parity group without parity recalculation.

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(19) **JAPANESE PATENT OFFICE**

PATENT ABSTRACTS OF JAPAN

(11) Publication number: **2000122962 A**

(43) Date of publication of application: 28.04.00

(51) Int. Cl **G06F 13/14** **G06F 9/06**	

(21) Application number: 10289332	(71) Applicant **NEC CORP**
(22) Date of filing: 12.10.98	(72) Inventor: **OSHIMO AKIYO**

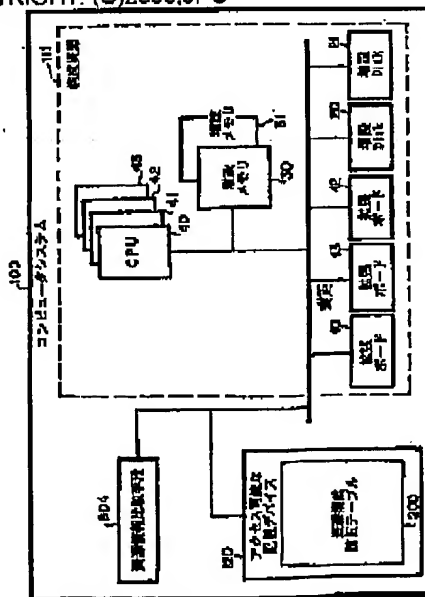(54) **SYSTEM AND METHOD FOR COMPARING CONSTITUTION RESOURCE OF COMPUTER SYSTEM**

(57) Abstract

PROBLEM TO BE SOLVED: To provide a system for detecting the change of the respective elements of a constitution resource in a computer system in a short time.

SOLUTION: The system for comparing constitution resource of a computer system is provided with a resource constitution information table 200 storing resource information of the respective elements of a constitution resource in a computer system 100 and a resource information record formed of an error detection parity calculated from resource information, a resource information acquirement means acquiring resource information of the respective elements of the present constitution resource, an error detection parity calculation means calculating an error detection parity from resource information obtained by the resource information acquirement means and an error detection parity comparison means comparing the error detection parity of the resource information record in the resource constitution information table 200 with the error detection parity calculated by the error detection parity calculation means.

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(19) **JAPANESE PATENT OFFICE**

PATENT ABSTRACTS OF JAPAN

(11) Publication number: **2003303057 A**

(43) Date of publication of application: 24.10.03

(51) Int. Cl **G06F 3/06**		

(21) Application number: 2003085671	(71) Applicant: **TOSHIBA CORP**
(22) Date of filing: 08.12.00	(72) Inventor: **SASAMOTO KYOICHI**
(62) Division of application: 2000374616	**TAKAKUWA MASAYUKI**

(54) **METHOD FOR DATA RECOVERY AND DISK ARRAY CONTROLLER IN DISK ARRAY APPARATUS**

(57) Abstract

PROBLEM TO BE SOLVED: To achieve quick detection and recovery of media failures by executing media check processing with a distinction between areas actually in use and not in use at a file system among disk areas of a disk array.

SOLUTION: In a media check processing for checking partial failures of a plurality of HDDs (hard disk drives) composed of the disk array, it is determined whether each stripe in the disk areas of the disk array is used by the file system or not based on a disk source management table (S41, S42), and a media check including data reading from the HDDs is executed only for a stripe (a first stripe) used by the file system (S43, S44).